

International
IR Rectifier

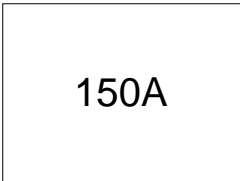
SERIES
45L(R), 150K/ KS(R)

STANDARD RECOVERY DIODES

Stud Version

Features

- Alloy diode
- High current carrying capability
- High surge current capabilities
- Stud cathode and stud anode version

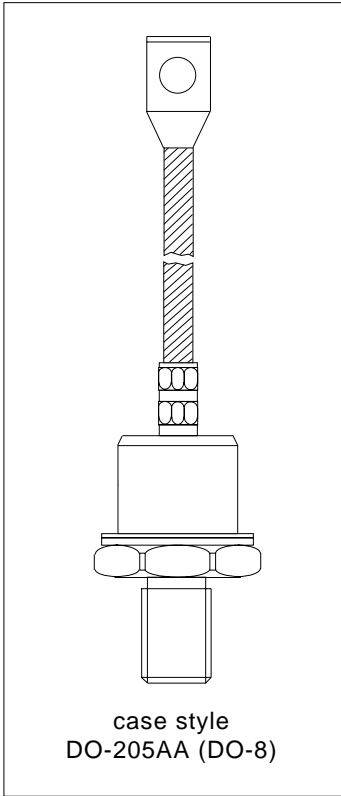


Typical Applications

- Battery charges
- Welders
- Machine tool controls
- High power drives
- Medium traction applications
- Freewheeling diodes

Major Ratings and Characteristics

Parameters	45L /150K	Units
$I_{F(AV)}$	150	A
$@ T_C$	150	°C
$I_{F(RMS)}$	235	A
I_{FSM} @ 50Hz	3570	A
@ 60Hz	3740	A
I^2t @ 50Hz	64	KA ² s
@ 60Hz	58	KA ² s
V_{RRM} range	100 to 600	V
T_J	- 40 to 200	°C



ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = 175^\circ\text{C}$ mA
45L(R) 150K(R) 150KS(R)	10	100	200	35
	20	200	300	
	30	300	400	
	40	400	500	
	60	600	720	

Forward Conduction

Parameter	45L /150K	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	150	A	180° conduction, half sine wave
	150	°C	
$I_{F(RMS)}$ Max. RMS forward current	235	A	DC @ 142°C case temperature
I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current	3570	A	t = 10ms No voltage
	3740		t = 8.3ms reapplied
	3000		t = 10ms 100% V_{RRM}
	3140		t = 8.3ms reapplied
I^2t Maximum I^2t for fusing	64	KA ² s	t = 10ms No voltage
	58		t = 8.3ms reapplied
	45		t = 10ms 100% V_{RRM}
	41		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	640	KA ² √s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.67	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
$V_{F(TO)2}$ High level value of threshold voltage	0.83		$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
r_{f1} Low level value of forward slope resistance	1.42	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
r_{f2} High level value of forward slope resistance	0.91		$(I > \pi \times I_{F(AV)}), T_J = T_J \text{ max.}$
V_{FM} Max. forward voltage drop	1.33	V	$I_{pk} = 471\text{A}, T_J = 25^\circ\text{C}, t_p = 10\text{ms}$ sinusoidal wave

Thermal and Mechanical Specifications

Parameter			45L /150K	Units	Conditions	
T _J	Max. junction operating temperature range		-40 to 200	°C		
T _{stg}	Max. storage temperature range		-40 to 200			
R _{thJC}	Max. thermal resistance, junction to case		0.25	K/W	DC operation	
R _{thCS}	Max. thermal resistance, case to heatsink		0.10		Mounting surface, smooth, flat and greased	
T	Mounting torque 45L	Min.	14.1 (125)	Nm (lbf-in)	Not lubricated threads	
		Max.	17.0 (150)			
		150K 150KS	Min.	12.2 (108)	Nm (lbf-in)	Lubricated threads
			Max.	15.0 (132)		
			Min.	11.3 (100)	Nm (lbf-in)	Not lubricated threads
			Max.	14.1 (125)		
			Min.	9.5 (85)	Nm (lbf-in)	Lubricated threads
			Max.	12.5 (110)		
wt	Approximate weight		100 (3.5)	g (oz)		
Case style		45L	DO-205AC (DO-30)		See Outline Table	
		150K-A	DO-205AA (DO-8)			
		150KS	B-42			

ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.031	0.023	K/W	$T_J = T_J \text{ max.}$
120°	0.038	0.040		
90°	0.048	0.053		
60°	0.071	0.075		
30°	0.120	0.121		

Ordering Information Table

Device Code	
	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 2px;">45</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 2px;">L</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 2px;">R</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 0 2px;">60</div> </div> <div style="display: flex; align-items: center; justify-content: center; margin-top: 5px;"> <div style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; margin: 0 2px;">1</div> <div style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; margin: 0 2px;">2</div> <div style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; margin: 0 2px;">3</div> <div style="border: 1px solid black; border-radius: 50%; padding: 2px 5px; margin: 0 2px;">4</div> </div>
1	- 45 = Standard version
2	- L = Essential Part Number
3	- R = Stud Reverse Polarity (Anode to Stud) None = Stud Normal Polarity (Cathode to Stud)
4	- Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)

45L(R), 150K/ KS(R) Series

Bulletin I2037 rev. B 03/03

Ordering Information Table

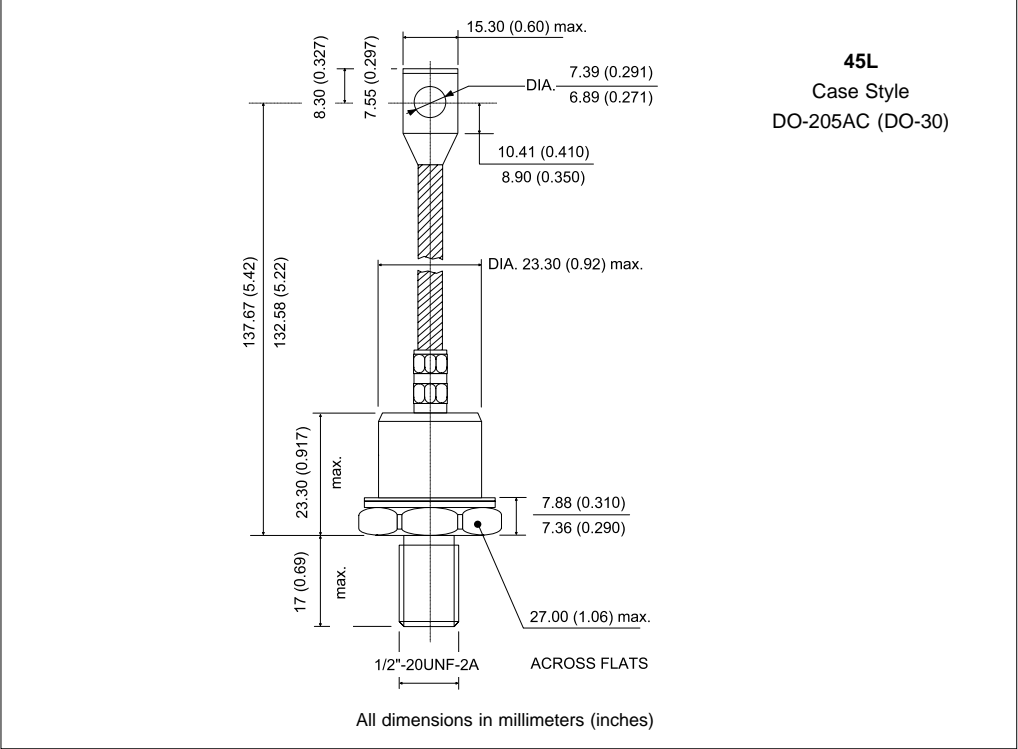
Device Code

15	0	K	R	60	A
①	②	③	④	⑤	⑥

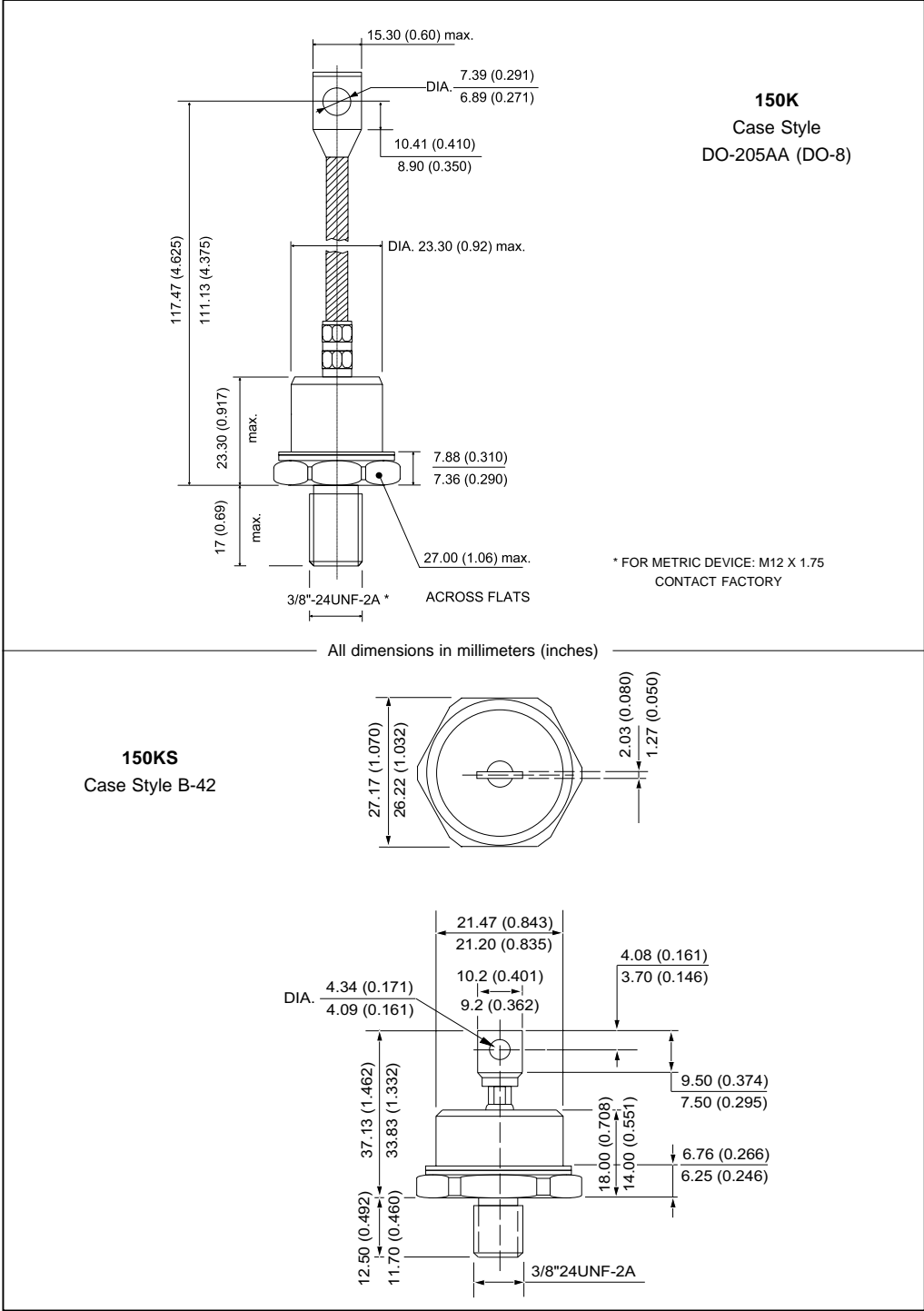
- 1** - 15 = Essential Part Number
- 2** - 0 = Standard Device
- 3** - Case Style
 - K = DO205AA (DO-8)
 - KS = B-42
- 4** - R = Stud Reverse Polarity (Anode to Stud)
 - None = Stud Normal Polarity (Cathode to Stud)
- 5** - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)
- 6** - A = Essential Part Number for 150K (Omitted for 150KS)

NOTE: For Metric Device M12 x 1.75 Contact Factory

Outline Table



Outline Table



45L(R), 150K/ KS(R) Series

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IRF Rectifier

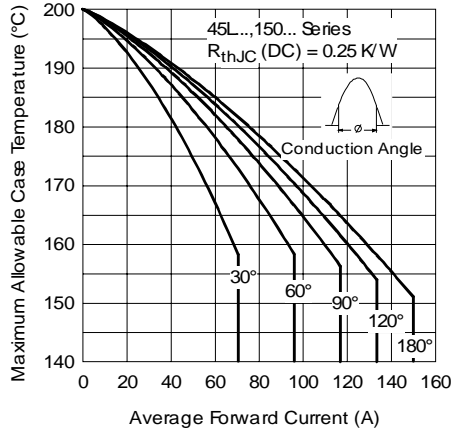


Fig. 1 - Current Ratings Characteristics

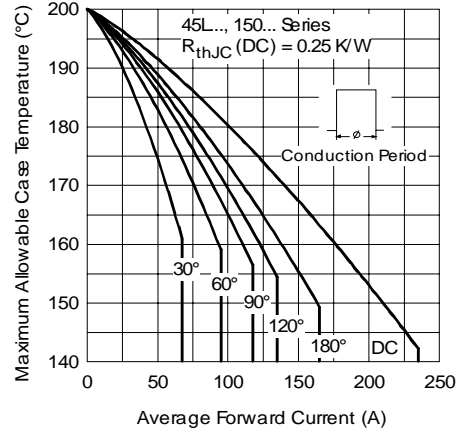


Fig. 2 - Current Ratings Characteristics

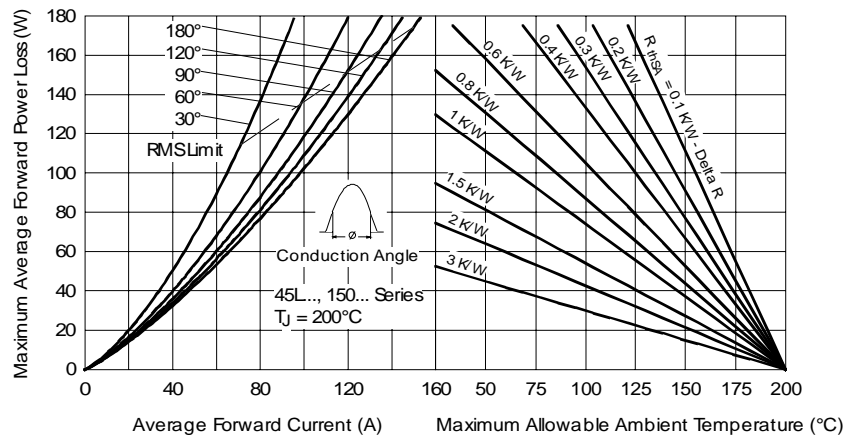


Fig. 3 - Forward Power Loss Characteristics

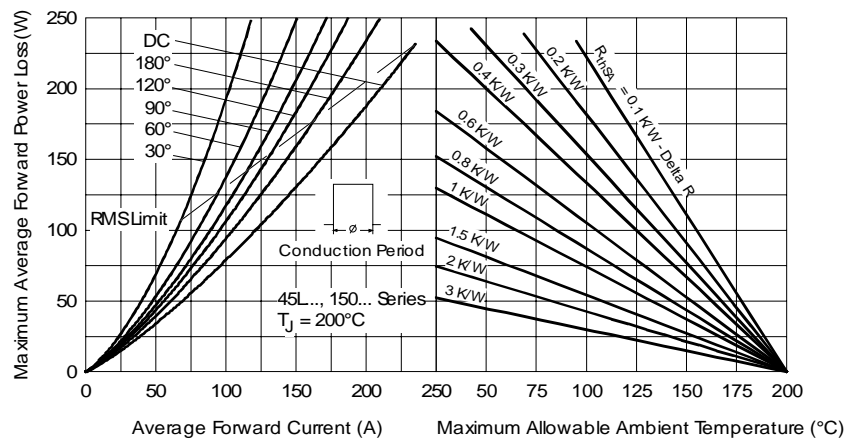


Fig. 4 - Forward Power Loss Characteristics

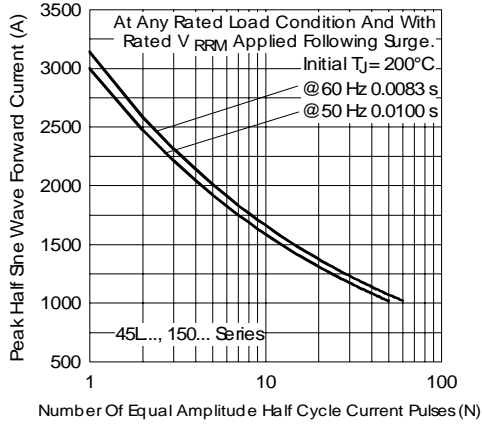


Fig. 5 - Maximum Non-Repetitive Surge Current

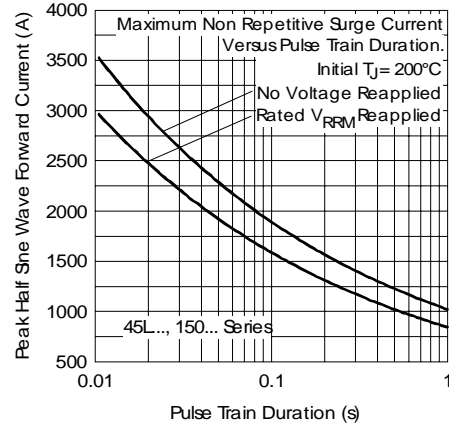


Fig. 6 - Maximum Non-Repetitive Surge Current

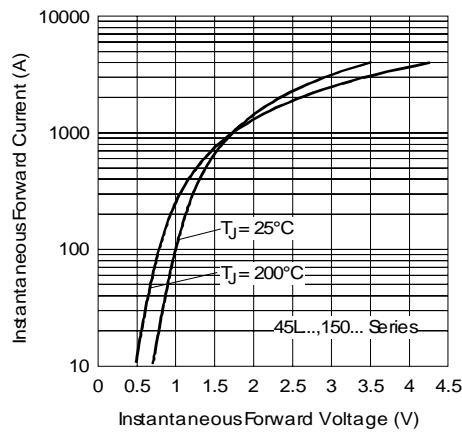


Fig. 7 - Forward Voltage Drop Characteristics

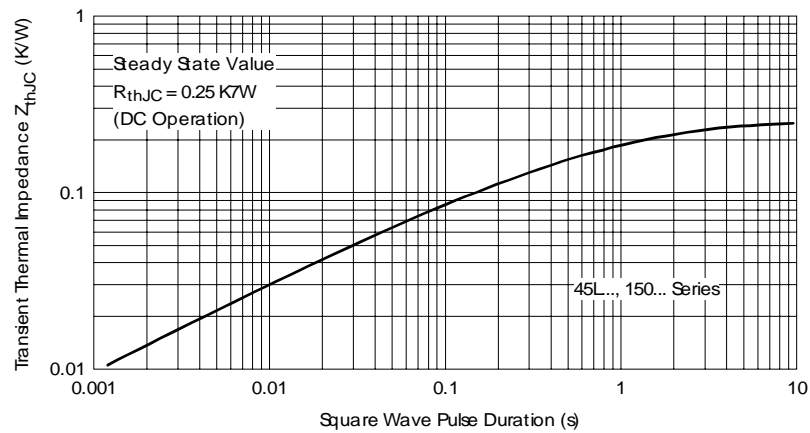


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

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Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 03/03